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ABSTRACT

Extralexical information, that is, those semantic properties evoked by words which are not usually accommodated in lexicons of any kind, is essential for the comprehension of numerous ordinary sentences in a natural language. A brief review of studies on forms of extralexical information shows that those works do not deal with: (1) questions of the relation to the lexicon of extralexical information, and (2) mechanisms which trigger, direct, and determine the use of this information in the process of the calculation of the meaning of a sentence. A theory of "script-based semantics" is proposed to deal with these two and related questions. This theory consists of a lexicon and a system of combinatorial rules. It is the structure of the lexicon which makes the theory distinct from other semantic theories. The theory purports to provide a theoretical basis for explicating composition concepts such as cohesiveness, unity, completeness, ambiguity, and obscurity. In addition. the clear theoretic understanding of the involved phenomena on the part of the instructor would make it possible to convey some script-related basic ideas to the student in the composition class. Several examples are provided to clarify the theory. (AMH)

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SCRIPTS AND THE COMPOSING PROCESS

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1. Lexical and Extralexical Information

From the time the first semantic theories emerged in the context of modern linguistic theory, it has been taken for granted that one of the components of any such theory is the dictionary, or the lexicon. Not only the existence and the necessity of the lexicon but also its structure have been largely taken for granted. The entry for a word in the lexicon was viewed as a more or less sophisticated version of componential analysis, and that some such analysis was indispensable was universally assumed throughout the semantic theories of the last decade.

No matter how the lexicon is compiled and with what theory it is associated, it is widely believed that a boundary should be drawn between the information which goes into it and the information which does not. This boundary is supposed to divide the linguistic knowledge of the native speaker as reflected in the lexicon, from his/her knowledge of the world, which is not supposed to be part of his/her linguistic competence.

Thus, in a normal lexicon associated with a formal semantic theory, the word pen would be characterized both as a writing utensil and as a small enclosure for animals or children (the format of the entries will, of course, vary from theory to theory). No information about the relative sizes of these two kinds of objects denoted by the homonymous lexical entity is likely to be included in the entries. However, it is precisely this information which is

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available to the native speaker and makes it possible for him/her to disambiguate the last sentence in (1) - the example is taken from Bar-Hillel (1964), where it is used in a different context.

(1) Little John was looking for his toy box. Finally he found it. The box was in the pen.

It appears that extralexical information, i.e. those semantic properties evoked by the words which are not usually accommodated in lexicons of any kind, is quite essential for the comprehension of numerous ordinary sentences of natural language, e.g. (2):

(2) (i) John was a dime short and had to do without milk.
(ii) Mary saw a black cat and immediately turned home.
(iii) Mary came into the room and all the men were charmed by her even before they sat down again.

(2i) can not be fully comprehended if the hearer does not possess the knowledge of the basic commodity-money-commodity formula, and no lexical entry on milk is likely to mention money. (2ii) is based on the availability of the piece of information about black cats being "unlucky". (2iii) evokes the now obsolete rule of etiquette according to which men stood up when a woman came into view, and the sentence is utterly incomprehensible to those who are not familiar with the rule. That extralexical knowledge is important can be further demonstrated by a set of related examples (3) for which no such information exists and which are therefore perceived as odd.

(3) (i) John was a dime short and had to do without family.

(ii) Mary saw a black cat and immediately bought a stamp.

(iii) Mary came into the room and all the men were charmed by her even before they sneezed.

2. Available Concepts for Extralexical Information

In the last decade or so, there has emerged a number of works which imply that some semantic information which is not stored in the lexicon, is involved in the process of the calculation of the meaning of a compound linguistic entry such as the sentence.

One of the early suggestions came from Staal (1967) and Bar-Hillel (1967) in their responses to Katz and Fodor's (1963) semantic theory. Staal proposed to enlarge their lexicon by accommodating in it such conversive relations as those between follow and precede or buy and sell. Bar-Hillel claimed that relations of that kind were, in fact, meaning rules and as such, along with many other meaning rules, e.g., Carnap's (1955) meaning postulates, cannot and should not be squeezed into a dictionary format of any kind.

Various works on semantic recursion and presupposition of the late 1960's - early 1970's (Raskin, 1968; Kiparskys, 1971; Lakoff, 1971; Keenan, 1971; Cooper, 1974) put forward the idea that the meaning of the sentence was dependent in many important ways on some semantic information available to the speaker/hearer prior to the production or perception of the sentence and not present in it overtly.

The idea behind conversational postulates (Gordon and Lakoff, 1975; Morgan, 1977) and implicatures (Grice, 1975) is that certain procedures are available to the speaker which enable him/her to calculate the meaning of the

sentence even if it is different from the literal meaning. Similarly, Searle's (1975) indirect speech acts are based on the unexplored notion of "missing background information" which should be at the speaker's disposal in order to make the necessary step from the directly apparent but unintended speech act to the intended indirect one. Chomsky (1975) speaks about the "unspecified assumptions, beliefs, attitudes and conventions" which constitute the speaker's "common sense", an important component of linguistic competence.

Inference rules, entailments, conjectures, cliches, allusions, etc., can be added to this list of what the competent speaker should have at his/her disposal.

Most if not all of the available works on these forms of extralexical information do not deal with two important questions arising in this context: How is this information related to the lexicon of the language? What are the mechanisms which trigger, direct and determine the use of this information in the process of the calculation of the meaning of a sentence?

3. Script-Based Semantics

Script-oriented semantic theory is designed to provide the answers to these two and related questions. It consists of a lexicon and a system of combinatorial rules, and it is the structure of the lexicon which makes the theory distinct from other semantic theories.

It is postulated that in order to comprehend ordinary sentences of his/her language the speaker must have internalized a large but finite number of cognitive structures of common sense which represent their knowledge of certain routines, basic situations, etc., or in other words, their knowledge of what people typically do in certain situations, how they do it, in what order, etc.

We are referring to these cognitive structures as the "scripts". (4) is an informal and simplified presentation of the script DOCTOR:

(4) DOCTOR

Subject: [+Human][+Adult]

Activity: >Study medicine

=Receive patients

=Cure disease

Place: >Medical School

=Doctor's office

Time: >Many years

=Every day

Condition: Face to face

('>' in time refers to the past, '=' to the present.)

Formally, a script is a graph with semantic nodes and links, and it is connected with the adjacent scripts within a continuous graph (see below). Every word of the lexicon corresponds to either a node or a link or some combination of nodes and/or links in the graph, depending on the conceptual complexity of the lexical item, which, of course, varies a great deal. Every word evokes the nodes and links which are immediately adjacent to it in the graph. In this sense, the constituents of any sentence evoke the script(s) associated with them which have been internalized by the speaker. Thus, the native speaker will attribute John's failure in (5i) to the hopelessness of the enterprise which follows immediately from what he/she knows about eating, hamburgers and spoons. John's failure in (5ii), however, must be attributed to something else because the native speaker will not possess any script knowledge

about the situation which will explain the failure - in fact, from the point of view of the available scripts (5ii) is perfectly all right.

(5) (i) John tried to eat his hamburger with a spoon but did not succeed.

(ii) John tried to eat his hamburger with a fork and knife but did not succeed.

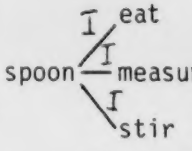
Just as in the case of (2) and (3), the semantic difference between the two sentences in (5) cannot be accounted for in terms of an ordinary lexicon, whether formalized or not. Neither the lexical entries for eat, hamburger or spoon nor the ones for those words in terms of which they will be explained, will contain any explicit or implicit information about the fact that hamburgers do not belong to the class of liquid or dry substances that can be eaten with a spoon. This can only mean that the information about the "non-spoonability" of the hamburger which clearly determines the speaker's judgment concerning (5i), is available to him/her not from any ordinary lexicon but rather from an internalized script. Instead of postulating a separate storage for this kind of information along with the lexicon (as was implied by the cited sources on extralexical notions), script-based semantics views the lexicon as directly incorporating that other storage within the lexical entries.

The relation between the lexicon in the theory and the scripts is twofold. First, as mentioned above, each lexical entry evokes the scripts of which it is part. Secondly, each lexical entry is defined only in terms of such scripts as a certain narrow domain of the graph. The scripts are larger domains of the graph and every lexical entry is, in fact, an intersection of several scripts. Ideally, the entire lexicon of a language is viewed as a continuous graph

connecting all the entries of the language. In the sentence, every constituent, i.e., a lexical entry evokes all the scripts with which it can be associated and the combinatorial rules work out a compatible combination of all the evoked scripts which determine and delimit the meaning of the sentence. Two or more compatible combinations of scripts will, of course, be associated with an ambiguous sentence.

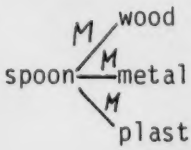
Thus, in the continuous graph of the script-based semantic theory, the node spoon, for instance, will be related to a number of other nodes in the following ways:

(6) (i) spoon —H— cutlery —H— instrument (H = Hyponymy)

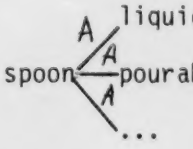
(ii)


(I = Instrument)

(iii) spoon —E— fork —E— knife (E = Equivalency, i.e., membership in the same class or category)

(iv)


(M = Material)

(v)


(A = Applicability)

Naturally, it is naive to expect a graph combining all the information in (6) plus all the other semantic connections of spoon not included in the example to be bidimensional, and there is no reason, whether neurophysiological, psychological, logical or algebraic, why such a graph

should be anything but multidimensional.

Scripts and script-like concepts (frames, schemata, daemons, etc.) have been in use for a number of years in some adjacent fields such as psychology, sociology, anthropology, artificial intelligence and education (see, for instance, Bartlett, 1932; Goffman, 1974; Bateson, 1972; Charniak, 1972, 1975; Schank and Abelson, 1977; Minsky, 1975; Chafe, 1977; Tannen, 1979; Freedle, 1977, 1979). The difference between the ways in which scripts are used in those disciplines, on the one hand, and the script-based semantic theory as outlined here, on the other, is that no systematic attempt has been made in those fields to justify the used scripts in terms of their linguistic and/or psychological reality, i.e., to prove that they are indeed part of the native speaker's competence. This theory is based on the conviction that unless the postulated or discovered scripts approximate the native speaker's intuition pretty accurately, they cannot serve as a valid basis for any linguistic theory in any respect, and a conceptual apparatus for dealing with the adequacy and justification aspects of the scripts is being developed (see Raskin, 1979). It is claimed and firmly believed that no unjustified, ad hoc scripts or any other concepts can be fruitfully used in linguistic applications such as the analysis of the composing process.

4. Scripts and the Composing Process

There are two basic kinds of application of the script-based semantic theory to the composing process. First, the theory provides a powerful and clearly outlined theoretical basis for explicating such important but poorly defined concepts as cohesiveness, unity, completeness, ambiguity, obscurity, etc. Secondly, the clear theoretic understanding of the involved phenomena on

the part of the instructor makes it possible to convey some script-related basic ideas to the student in a simplified and accessible way.

First, let us deal with a few examples of theoretical application. (7) is a typical textbook example of a "bad" paragraph - it is, in fact, borrowed from a popular textbook used in freshman composition classes (McCrimmon, 1980):

(7) (1) Excavations in the past ten years have really formed the complete city of Pompeii. (2) As it stands now, most of Pompeii has been uncovered. (3) The ancient city of Pompeii covered 163 acres, and at this time there are about 150 yards to go. (4) Scientists believe that Vesuvius is about to erupt again, and that would cover the city. (5) Archaeologists have not had to contend with Vesuvius at all in the past 10 years, and progress has been faster. (6) Pompeii itself is now a museum, and people can walk on guided tours through all that the archaeologists have uncovered. (7) The techniques used in the past 10 years have been more scientific and were more toward the preservation of this unknown city.

The script-based semantic theory uncovers all the faults of the paragraph in a systematic and formal way in terms of the evoked scripts and inferences from them. Thus, for instance, the word complete in (1) will evoke a script of completeness which will run into conflict with the script evoked by most in (2). The word acres in (3) will evoke the script of area which will not be easily reconciled with the script of length evoked by yards. (4) will evoke the scripts which have nothing whatsoever to do with the scripts evoked by (1-3) so far unless the reader knows a number of historical scripts connecting Vesuvius, Pompeii, volcanoes and eruption, and the text has no control over those implied

scripts. (6) returns the reader to the previously activated scripts and abandons the ones used in (4-5). (7) swings the reader back to the second set of scripts and goes over some material (past ten years) for the second time; besides, the word unknown evokes a script which is likely to further confuse the reader since Pompeii has been made "known" to him to a certain extent by the previous discussion.

These examples constitute an incomplete list of what goes wrong in this particular paragraph or any other paragraph. Even this limited set of facts demonstrates not only that the scripts uncover stylistical faults but also, much more importantly, that certain rules of composing can be clearly defined in terms of the theory. (8) contains some examples of script-based rules of composition:

(8) (i) Every sentence should postulate a new link between scripts. A sentence which fails to do it is trivial because the "old" links are internalized by the reader already.

(ii) Every next sentence should deal with some scripts or part of the script introduced by the previous sentence.

(iii) Every script evoked by every sentence should be either have mentioned previously or firmly believed to be known and immediately accessible to the reader.

(iv) No two scripts should evoke the semantic material which is mutually contradictory unless the script of contradiction is evoked as well (i.e., the text is about contradiction).

(v) No script should be evoked twice unless the script of repetition is evoked as well.

The script-based semantic theory provides the writer with a fool-proof tool against uncontrolled ambiguity, i.e., cases when the writer's intended meaning does not coincide with the one that the reader grasps, or in other words, when the writer's obvious context does not coincide with the reader's obvious context (see Raskin, 1977). The combinatorial mechanism of the theory associates the sentence with all the compatible combinations of scripts, thus making the potential ambiguity explicit and controlled. The theory will, for instance, immediately characterize (9) as ambiguous and protect the author and publisher of the ad from ridicule by The New Yorker:

(9) A '78 Chevrolet Malibu traded in by a young executive in mint condition.

The practical application of the script-based semantic theory to the composing process involves the conveying of the knowledge which the theory makes available to the instructor, to the student of composition in the classroom. The most important component of this educational situation is that the linguistic nature of the involved phenomena is made available to the instructor in an explicit, formal, detailed and justified way. The instructor should develop educational techniques designed to make the student aware of the involved phenomena in accessible ways. My own limited experience in the composition classroom as well as that of my graduate students has demonstrated that the students treat the scripts at least as a clear and useful metaphor for the composing process and profit directly from its constant use in the classroom discussions of cohesiveness, unity, order, ambiguity and other notions of composition which elude any rational treatment otherwise and have to be discussed in terms of taste, intuition and experience which a beginning writer normally lacks.

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